

IN THE CLAIMS

1. (Canceled).

2. (Canceled).

3. (Canceled).

4. (Canceled).

5. (Currently Amended) An harmonic article identification system, comprising:

at least one semiconductor device carried by an article and responsive to at least two RF signals to generate an harmonic ~~intermodulation product as output~~ signal;

an antenna receiving the harmonic ~~intermodulation product~~ signal and, in response to the antenna receiving the harmonic ~~intermodulation product~~ signal, generating an analyzer signal; and

a signal analyzer coupled to the antenna and responsive to the analyzer signal to identify the article carrying the at least one semiconductor device.

6. (Original) The harmonic article identification system as in Claim 5 wherein the at least one semiconductor device comprises at least one RF diode.

7. (Original) The harmonic article identification system as in Claim 6 wherein the at least one diode responds to RF signals in a frequency range from about 24.0 GHz to about 24.1 GHz.

8. (Original) The harmonic article identification system as in Claim 5 wherein the antenna comprises a dipole having a length of one wavelength at one of the at least two RF signals.

9. (Original) The harmonic article identification system as in Claim 5 wherein the at least one semiconductor device comprises a signature identification of the article carrying the at least one semiconductor device.

10. (Currently Amended) An harmonic article identification system, comprising:

a first signal generator operating to generate an RF signal at a first frequency;

a second signal generator operating to generate an RF signal at a second frequency;

two or more RF diodes carried by an article and responsive to the first and second frequencies to generate an harmonic ~~intermodulation product as output~~ signal;

an antenna receiving the harmonic ~~intermodulation product~~ signal and, in response to ~~antenna~~ receiving the harmonic ~~intermodulation product~~ signal, generating an analyzer signal; and

a signal analyzer coupled to the antenna and responsive to the analyzer signal to identify the article.

11. (Currently Amended) The harmonic article identification system as in Claim 10 wherein the analyzer signal from the receiving antenna to the signal analyzer comprises a subtraction of the first frequency signal from twice the second frequency signal.

12. (Previously Presented) The harmonic article identification system as in Claim 10 wherein the analyzer signal from the receiving antenna to the signal analyzer varies in accordance with the expression:

$$2F1 - F2,$$

wherein:

F1 equals the first frequency, and

F2 equals the second frequency.

13. (Currently Amended) The harmonic article identification system as in Claim 10 wherein the analyzer signal from the receiving antenna to the signal analyzer comprises a subtraction of the second frequency signal from twice the first frequency signal.

14. (Previously Presented) The harmonic article identification system as in Claim 10 wherein the analyzer signal from the receiving antenna to the signal analyzer varies in accordance with the expression:

$$2F2 - F1,$$

wherein:

F1 is the first frequency, and

F2 is the second frequency.

15. (Currently Amended) The harmonic article identification system as in Claim 10 wherein the two or more RF diodes comprise a signature identification of the article.

16. (Currently Amended) The harmonic article identification system as in Claim 10 wherein the at least two or more RF diodes respond ~~one RF diode responds~~ to RF signals in a frequency range from about 24.0 GHz to about 24.1 GHz.

17. (Original) The harmonic article identification system as in Claim 10 wherein the antenna comprises a dipole having a wavelength determined by either the first frequency or the second frequency.

18. (Currently Amended) A method for harmonic article identification, comprising:

generating at least two RF signals at separate frequencies;

generating an harmonic ~~intermodulation product~~ signal by two or more RF diodes carried by an article and responsive to the at least two RF signals;

generating an analyzer signal from an antenna receiving the harmonic ~~intermodulation~~ signal; and

generating an article identification signature by analyzing the analyzer signal from the antenna.

19. (Original) The method for harmonic article identification as in Claim 18 further comprising storing the article signature for subsequent identification of the article.

20. (Original) The method for harmonic article identification as in Claim 19 further comprising scanning the stored article signatures for identification of an article.

21. (Original) The method for harmonic article identification as in Claim 20 further comprising generating an article identification in response to scanning the stored article signatures.

22. (Currently Amended) An harmonic article identification system, comprising:

a first signal generator outputting an RF signal at a frequency of 24.0 GHZ;

a second signal generator outputting an RF signal at a frequency of 24.1 GHZ;

two or more RF diodes carried by an article and responsive to the 24.0 GHZ frequency and the 24.1 GHZ frequency to generate an harmonic ~~intermodulation product as~~ output signal;

a dipole antenna receiving the harmonic ~~intermodulation product~~ signal and, in response to the ~~dipole~~ dipole antenna receiving the harmonic ~~intermodulation product~~ signal generating an analyzer signal varying in accordance with the expression:

$$2F1 - F2,$$

wherein:

F1 equals the 24.0 GHZ frequency, and

F2 equals the 24.1 GHZ frequency; and

a signal analyzer coupled to the dipole antenna and responsive to the analyzer signal to identify the article.

23. (Currently Amended) An harmonic article identification system, comprising:

a first signal generator outputting an RF signal at a frequency of 24.0 GHZ;

a second signal generator outputting an RF signal at a frequency of 24.1 GHZ;

two or more RF diodes carried by an article and responsive to the 24.0 GHZ frequency and the 24.1 GHZ frequency to generate an harmonic signal having a third order harmonic ~~intermodulation product as output~~;

a dipole antenna receiving or any other tuned antenna receiving the ~~third harmonic intermodulation product~~ harmonic signal and, in response to the dipole antenna receiving the ~~third harmonic intermodulation product~~ harmonic signal, generating an analyzer signal varying in accordance with the expression:

$$2F2 - F1,$$

wherein:

F1 equals the 24.0 GHZ frequency, and

F2 equals the 24.1 GHZ frequency; and

a signal analyzer coupled to the dipole antenna and responsive to the analyzer signal to identify the article.

24. (Currently Amended) An identification system for articles carrying at least one semiconductor device generating an harmonic ~~intermodulation product as output~~ signal, the system comprising:

a spectrum analyzer responsive to an harmonic ~~intermodulation product~~ signal generated as output by at least one semiconductor device carried by an article, the spectrum analyzer generating an identification signal;

a signature memory storing the identification signatures of at least one article for identification;

a comparator responsive to the identification signal of the spectrum analyzer and coupled to receive the identification signatures of at least one article for identification from the signature memory, the comparator generating an output identifying an article carrying at least one semiconductor device from the stored identification signatures.

25. (Currently Amended) An identification system as in Claim 24 further comprising an antenna receiving the harmonic ~~intermodulation product~~ signal generated by the at least one semiconductor device carried by an article and, in response to the antenna receiving the harmonic ~~intermodulation product~~ signal, generating an analyzer signal, the spectrum analyzer responsive to the analyzer signal to generate the identification signal.

26. (Original) The identification system as in Claim 25 wherein the antenna comprises a dipole having a length of one wavelength at one of at least two RF signals.

27. (Original) The identification system as in Claim 24 further comprising a display responsive to the signal generated by the comparator to indicate identification of an article.

28. (Currently Amended) The identification system as in Claim 24 further comprising:

a first signal generator operating to generate an RF signal at a first frequency;

a second signal generator operating to generate an RF signal at a second frequency signal; and

wherein the at least one semiconductor device carried by the article responds to the first and second frequencies to generate the harmonic ~~intermodulation product~~ as output signal.

29. (Currently Amended) The identification system as in Claim 28 further comprising an antenna receiving the harmonic ~~intermodulation product~~ signal from the article carrying the at least one semiconductor device and, in response to the antenna receiving the harmonic ~~intermodulation product~~ signal, generating an analyzer signal; and

wherein the spectrum analyzer responds to the analyzer signal to generate an identification signal.

30. (Original) The identification system as in Claim 29 wherein the antenna comprises a dipole having a length of one wavelength at either the first frequency or the second frequency.

31. (Currently Amended) A method for harmonic article identification, comprising:

generating at least two RF signals at separate frequencies;

radiating with the at least two RF signals at least one semiconductor device carried by an article for identification;

generating an harmonic ~~intermodulation-product~~ signal by the at least one semiconductor device carried by the article and radiated with the at least two RF signals;

generating an analyzer signal from an antenna receiving the harmonic ~~intermodulation-product~~ signal, the ~~analyzer~~ analyzer signal being generated in response to the antenna receiving the harmonic ~~intermodulation-product~~ signal;

comparing the analyzer signal with one or more stored identification signatures, the comparator generating a signal to identify the article carrying the at least one semiconductor device from the stored identification signatures.

32. (Original) The method for harmonic article identification as in Claim 31 further comprising storing the identification signatures for subsequent comparison with analyzer signals.

33. (Original) The method for harmonic article identification as in Claim 32 wherein comparing the analyzer signal with identification signatures comprises:

scanning the stored signatures for comparison with the generated analyzer signal; and

generating an article identification signal in response to a comparison between one of the stored identification signatures and the analyzer signal.

34. (Currently Amended) An harmonic article identification tag, comprising:

at least one RF diode carried by an article and responsive to at least two RF signals to generate an harmonic signal having a third order harmonic intermodulation output product defined by the expression of twice a first one of the two RF signals less a second one of the two RF signals, the at least one diode generating harmonic signal characteristics for RF article identification.